

Amendments to the Figures

Figures 1-2 have been amended by adding the label “(RELATED ART)” below each Figure, as required by the Examiner. Replacement Sheets (as required by 37 C.F.R. 1.121(d)) are attached to this Amendment.

Remarks

Applicants' undersigned representative wishes to thank Examiner Malek for the thorough examination of the present application, the indication of allowable subject matter (i.e., with regard to Claims 64-66 and 107-108), and (with Supervisory Primary Examiner Ghayour) the helpful and courteous discussion held with the undersigned on August 16, 2007. To expedite and/or facilitate prosecution of the application, and without conceding any issues of patentability, the claims have been amended to recite a third component derived from a filtered ideal processed data sequence (or an ideal processed data sequence generated by a detecting a sequence of the processed data sequence). No new matter is introduced by the present Amendment. The following remarks shall summarize and further expand upon topics discussed.

Claims 7, 8, 23, 24, 32-35, 37, 52, 55-60, 62, 76, 78, 82-84, 86, 88, 95-96, 104-105 and 114 have been canceled. New Claims 117-140 have been added. No new matter is introduced, and the above amendments to the claims are fully supported by the application as originally filed. Thus, Claims 1-6, 9-22, 25-31, 36, 38-51, 53-54, 61, 63-75, 77, 79-81, 85, 87, 89-94, 97-103, 106-113 and 115-140 are active in the present application.

The Rejection of Claims 1-3, 7, 8, 10, 12-15, 30-36, 38, 40-43, 49-52, 58-61, 67, 71, 72, 74-76, 82-86, 91, 93, 94, 97-99, 109, 111-113 and 115 under 35 U.S.C. § 102(b)

The rejection of Claims 1-3, 7, 8, 10, 12-15, 30-36, 38, 40-43, 49-52, 58-61, 67, 71, 72, 74-76, 82-86, 91, 93, 94, 97-99, 109, 111-113 and 115 under 35 U.S.C. § 102(b) as being anticipated by Alelyunas et al. (U.S. Pat. No. 6,285,709; hereinafter "Alelyunas") is respectfully traversed.

Alelyunas discloses an apparatus and methods of compensating for distortions introduced in communication signals received over a telephone network. An adaptive linear equalizer (LE) pre-filter is used in conjunction with an adaptive decision feedback equalizer (DFE) to provide error filtering. An error signal is generated relative to the difference between the determined states of the decision mechanism of the DFE and the filtered communication signals from the

LE. Further, an error filter provides a filtered output of the generated error signal, wherein the error filter has an error filter characteristic defined in accordance with the known telephone network transmission medium. The LE for the received sampled communication signals has a LE pre-filter characteristic defined in accordance with the filtered output of the error filter, using a recursive least-mean-square (LMS) technique (see the Abstract of Alelyunas).

In the embodiment of FIG. 3, LE 86 provides its output to a DFE 90 such that weighting coefficients  $C_k$  88 and  $C_j$  92 are both provided in response to an error signal 94 from the DFE 90 (see also col. 5, ll. 11-14 of Alelyunas). Thus, in this embodiment, the scheme of Alelyunas feeds back only a single term (error signal 94) to provide weighting coefficients  $C_k$  88 and  $C_j$  92 to LE 86 and DFE 90.

In the embodiment of FIG. 4, the error signal 94 (from the DFE 90, and which provides the same weighting coefficients  $C_j$  92 as in FIG. 3) is filtered by an LE error filter 102 to provide an error signal 104 which has been filtered for use in updating tap weights  $C_k$  88 in the LE 86 (see also col. 5, ll. 30-35 of Alelyunas). In this embodiment, the scheme of Alelyunas feeds back two terms (error signal 94 and filtered error signal 104) from a serial or linear path to provide weighting coefficients to LE 86 and DFE 90.

Finally, in the embodiment of FIG. 5, the error signal 94 (from the DFE 90) is filtered by LE error filter 102 (as in FIG. 4) to provide filtered error signal 104 and by DFE error filter 108 to provide error signal 110. Filtered error signal 104 is used in updating tap weights  $C_k$  88 in the LE 86, and error signals 110 is used to update or adjust the tap weights  $C_j$  92 (see also col. 6, ll. 1-11 of Alelyunas). However, in this embodiment, the scheme of Alelyunas feeds back two error terms (filtered error signals 104 and 110) from the error signal 94 provided by DFE 90.

Alelyunas does not appear to at least update the LE and/or DFE coefficients with each of a filtered data term and a filtered error term, where the filtered error term is generated from a filtered processed data sequence and a filtered ideal processed data sequence (see, e.g., the fifth element of Claims 1 and 17, and the third element of Claims 49 and 74). For example, in Claims 1 and 17, a processed data sequence is filtered using a second set of filter characteristics structurally and/or functionally identical to a first set of filter characteristics (used to generate the

filtered data term), and the filtered ideal processed data sequence is generated from the processed data sequence using a third set of filter characteristics having a subset of filter characteristics structurally and/or functionally identical to the first set of filter characteristics. In Claims 49 and 74, the second filter (having characteristics structurally and/or functionally identical to a first filter used to generate the filtered data term) provides a filtered equalized data output, a signal processor provides the ideal equalized data output from the equalized data output, and a third filter (having a subset of filter characteristics structurally and/or functionally identical to the first filter) filters the ideal equalized data output.

Thus, other than the filter or equalizer having the coefficients, the present invention uses three filters having at least some structurally and/or functionally identical characteristics to produce three terms for directly or indirectly updating the coefficients, two of which are combined to generate the filtered error term. Alelyunas discloses at most two such filters. As a result, Alelyunas does not disclose all of the limitations of the present Claims 1-3, 7, 8, 10, 12-15, 49-52, 58-61, 67, 71, 72, 74-76, 82-86, 91, 93, 94, 97-99, 109, 111-113 and 115.

In Claims 30 and 44, a processed data sequence is sequence-detected to generate an ideal processed data sequence, a difference is determined between the processed data sequence and the ideal processed data sequence to produce an error term, then the filtered error term is generated using a second set of filter characteristics structurally and/or functionally identical to the first set of filter characteristics (see, e.g., the third-fifth elements of Claims 30 and 44). As discussed above, Alelyunas does not disclose producing three terms for directly or indirectly updating the coefficients. Consequently, Alelyunas cannot disclose determining the difference between two such terms, then filtering that difference to generate the filtered error term. As a result, Alelyunas does not disclose all of the limitations of the present claims 30-36, 38, and 40-43.

Thus, for at least these reasons, the rejection is unsustainable, and should be withdrawn.

The Rejection of Claims 16-29, 44-48, 69-70 and 116 under 35 U.S.C. § 103(a)

The rejection of Claims 16-29, 44-48, 69-70 and 116 under 35 U.S.C. § 103(a) as being unpatentable over Alelyunas is respectfully traversed.

As discussed above, Alelyunas does not appear to at least disclose updating the LE and/or DFE coefficients with each of a filtered data term and a filtered error term, where the filtered error term is generated from a filtered processed data sequence *and* a filtered ideal processed data sequence (see, e.g., the fifth element of Claims 1 and 17, and the third element of Claims 49 and 74). Thus, Claims 16-29, 69-70 and 116 (which depend directly or indirectly on Claim 1, 17, 49 or 74), are patentable over Alelyunas for at least these reasons.

With regard to Claims 30 and 44, as discussed above, Alelyunas does not disclose producing three terms for directly or indirectly updating the coefficients. Consequently, Alelyunas cannot disclose determining the difference between two such terms, then filtering that difference to generate the filtered error term. Thus, for at least these reasons, this ground of rejection is unsustainable, and should be withdrawn.

The Rejection of Claims 4-6, 9, 37, 53-57, 62, 63, 73, 77-81, 87-89, 100-102, and 104-106 under 35 U.S.C. § 103(a)

The rejection of Claims 4-6, 9, 37, 53-57, 62, 63, 73, 77-81, 87-89, 100-102, and 104-106 under 35 U.S.C. § 103(a) as being unpatentable over Alelyunas in view of the Background of the Invention from the present application (incorrectly characterized as “Applicant’s admitted prior art”) is respectfully traversed.

As discussed above, Alelyunas does not appear to at least disclose or suggest updating the LE and/or DFE coefficients with a filtered *data* term. Thus, Alelyunas is saliently deficient with regard to the present claims. The Background from the present application, to the extent Applicants’ own application is available against them, fails to cure the deficiencies of Alelyunas.

Firstly, Applicants and Applicants’ representatives reiterate that there has been no admission that any part of the present application constitutes prior art. Thus, the traversal on

March 30, 2007 of any effective assertion of official notice that the Background of the present application is admitted prior art or is otherwise available as prior art against the present claims remains effective. Applicants' representative notes that the Office Action dated June 28, 2007 did not provide documentary evidence for this rejection to be maintained. See M.P.E.P. § 2144.03; see also *In re Zurko*, 258 F.3d at 1386, 59 USPQ2d at 1697 ("[T]he Board [or examiner] must point to some concrete evidence in the record in support of these findings" to satisfy the substantial evidence test).

That being said, even if one assumes for the sake of argument that the Background from the present application is available against the present claims, it does not cure the deficiencies of Alelyunas with regard to the present claims. At no point does Alelyunas or the Background from the present application suggest updating coefficients in a filter with each of a filtered data term and a filtered error term, where the filtered error term is generated from a filtered processed data sequence and a filtered ideal processed data sequence (see, e.g., the fifth element of Claims 1 and 17, and the third element of Claims 49 and 74). Claims 4-6, 9, 53-57, 62, 63, 73, 77-81, 87-89, 100-102, and 104-106 (which depend directly or indirectly on Claim 1, 17, 49 or 74), are patentable over Alelyunas and the Background from the present application for at least these reasons.

With regard to Claim 37, as discussed above, Alelyunas does not disclose determining the difference between two of three terms produced or generated for updating coefficients in a filter, then filtering that difference to generate the filtered error term, as recited in Claim 30. Thus, for at least these reasons, this ground of rejection is unsustainable, and should be withdrawn.

The Rejection of Claims 11 and 39 under 35 U.S.C. § 103(a)

The rejection of Claims 11 and 39 under 35 U.S.C. § 103(a) as being unpatentable over Alelyunas in view of Lu (U.S. Patent No. 6,768,796) is respectfully traversed.

As discussed above, Alelyunas does not appear to at least disclose or suggest updating the LE and/or DFE coefficients with each of a filtered data term and a filtered error term, where the filtered error term is generated from a filtered processed data sequence and a filtered ideal processed data sequence (see, e.g., the fifth element of Claim 1). Similarly, Alelyunas does not disclose producing three terms for directly or indirectly updating the coefficients and determining the difference between two such terms, then filtering that difference to generate the filtered error term (see Claim 30). Thus, Alelyunas is saliently deficient with regard to the present Claims 11 and 39. Lu fails to cure the deficiencies of Alelyunas.

Lu discloses methods and systems for echo cancellation (Title and Abstract, line 1). In particular, Lu discloses a coefficient vector generator ("CVG") 460 that appears to receive a filtered far end signal  $x(n)$  and an echo residual signal  $e(n)$  (col. 5, ll. 20-23 and 57-59, and FIG. 8 of Lu). A whitening means 495 such as a whitening filter that causes frequency domain spectrums of the far end signal  $x(n)$  signal and  $r(n)$  signal (from which echo residual signal  $e(n)$  is derived) to have flat frequency characteristics (col. 9, l. 65-col. 10, l. 7, and FIG. 8 of Lu).

However, Lu does not affirmatively disclose or suggest updating coefficients with the filtered far end signal and the echo residual signal  $e(n)$ , nor is it readily apparent from the disclosure of Lu that the filtered far end signal and the echo residual signal  $e(n)$  represent both a filtered data term and a filtered error term (much less a filtered error term generated from a filtered processed data sequence and a filtered ideal processed data sequence, as recited in Claim 1, or by determining the difference between two terms for updating filter/equalizer coefficients, then filtering that difference, as recited in Claim 30). As a result, Lu fails to cure the deficiencies of Alelyunas with regard to the present claims 11 and 39.

Thus, for at least these reasons, this ground of rejection is unsustainable, and should be withdrawn.

The Rejection of Claims 68, 92 and 110 under 35 U.S.C. § 103(a)

The rejection of Claims 68, 92 and 110 under 35 U.S.C. § 103(a) as being unpatentable over Alelyunas in view of Xia (U.S. Pat. Appl. Publ. No. 2002/0097795) is respectfully traversed.

As discussed above, Alelyunas does not appear to at least disclose or suggest an error term circuit that updates the LE and/or DFE coefficients with each of a filtered data term (from a first filter) and a filtered error term, where the filtered error term is generated from a filtered processed data sequence (from a second filter) and a filtered ideal processed data sequence (from a sequence detector and a third filter; see Claims 49 and 74). Thus, Alelyunas is saliently deficient with regard to the present Claims 68, 92 and 110. Xia fails to cure the deficiencies of Alelyunas.

Xia discloses a digital equalizer comprising a matched filter that, in conjunction with an FIR filter, assures a single peak with substantially greater energy than other peaks caused by ghosts, thereby permitting synchronization even with multiple, arbitrarily strong ghosts caused by strong multipathing, multiple transmitters, or both (Abstract). Other than the matched filter, an equalizer (i.e., FIR filter), and a feedback filter (which does not appear to be capable of updating the coefficients in the FIR filter; see FIGS. 2-3 of Xia), Xia appears to be silent with regard to hardware configured to update coefficients with both a filtered data term and a filtered error term, much less a filtered error term generated from a filtered processed data sequence and a filtered ideal processed data sequence, as recited in Claims 49 and 74. As a result, Xia fails to cure the deficiencies of Alelyunas with regard to the present Claims 68, 92 and 110 (which depend directly or indirectly on Claims 49 or 74).

Thus, for at least these reasons, this ground of rejection is unsustainable, and should be withdrawn.

The Objections to the Drawings

The objection to the drawings has been overcome by appropriate amendment. Applicants' undersigned representative appreciates the Examiner's patience with regard to this requirement.

Conclusions

In view of the above amendments and remarks, all bases for objection are overcome, and the application is in condition for allowance. Early notice to that effect is earnestly requested.

If it is deemed helpful or beneficial to the efficient prosecution of the present application, the Examiner is invited to contact Applicant's undersigned representative by telephone.

Respectfully submitted,



Andrew D. Fortney, Ph.D.  
Reg. No. 34,600  
THE LAW OFFICES OF ANDREW D. FORTNEY, PH.D., P.C.

401 W. Fallbrook Avenue, Suite 204  
Fresno, California 93711  
(559) 432-6847